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WMA MPQP Draft

CONSTRUCTION (MPQP)

Proportioning Warm Mix Asphalt General

Proportion all WMA additives by weight. Use either a continuous or batch type plant.

Ingredient Indicators

Indicators for proportioning devices must be in the plant control room. Indications must be clear, definite, accurate, and legible under normal operating conditions. If there is no plant control room, the proportioning device displays must be grouped and readable from where the proportion operations are controlled. Ingredient deliveries must be indicated and recorded in pounds, tons, or gallons with decimal subdivisions as applicable for each component. The indication must display rate of flow to show the rate of ingredient delivery. The indication must be equipped with a re-settable totalizer to indicate the ingredient quantity delivered. The indication for the mass-flow, Coriolis Effect type meter must be in weight. Volume is not acceptable as a unit of measurement for mass-flow, Coriolis Effect type meter. Indicators must be fully functional at all production rates. Multiple indicators for the same ingredient must agree to within 0.1 percent when compared directly. During production, the asphalt additive totalizer must not register when the asphalt metering system is not delivering asphalt to the mixer.

Liquid Measurement

Liquid measurement may be done with a container scale, or a meter. A meter is an electromechanical device designed to measure liquid ingredients. Meters must comply with production proportioning limits and calibration limits of Table A, "Meter Testing Extremes," in the Appendix. Meters for the determination of water quantity must be either volumetric or mass flow type; meters used for all other liquid additives used in WMA must be mass-flow, Coriolis Effect type.

Dry Ingredient Measurement

If a conveyor scale is used for measuring dry ingredients, it must comply with the limits

for production proportioning and calibration specified in Table B, “Conveyor Scale Testing Extremes,” in the Appendix. When other types of dry ingredient devices are used for weight proportioning, these systems must comply with the requirements in Table B, “Conveyor Scale Testing Extremes,” in the Appendix. Do not use beam scales for proportioning dry ingredients.

Ingredient Cutoffs

Continuous mixing plants must be equipped with cutoff devices that stop production when ingredient flow is detected to be less than specified. Batch mixing plants must be equipped with interlocks to prevent a new batch from starting until the weigh hoppers are empty, and interrupt the weighing cycle when the amount of material drawn from storage varies from the pre-selected amount by more than the tolerances specified in Section “WMA additive in Batch Plants”.

Weighing and Measuring Devices:

Weighing, measuring, and metering devices used to measure the quantity of materials used in the work shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Title 4, Chapter 9 of the California Code of Regulations, the provisions of the California Business and Professions Code, Division 5, and the California Department of Transportation Standard Specifications in Section 9. Devices not Type-approved by the Division of Measurement Standards shall be Type-approved in conformance with the requirements in California Test 109.

WMA additive in Batch Plants:

Proportion liquid WMA additives by weight using the appropriate meter for the material, or a container scale. The plant batch controller must operate automatically and comply with “Batch Mixing HMA Plants” in Chapter 2, II-F. The automatic batch controller must produce a log of batching data. The log consists of actual weights for each ingredient in the batch throughout production. Collected batch data must be stored by the plant controller for the duration of the contract, and made available to the Engineer upon request. The liquid WMA additives proportioning must be an integral part of the plant batching control equipment. Zero tolerance for the liquid WMA additives container scale is ± 0.01 percent of the asphalt binder batch weight. The indicated liquid WMA additives scale weight may vary from the pre-selected weight setting by up to ± 0.02 percent of the asphalt binder batch weight. Dispense liquid WMA additives into the stream of asphalt binder as it enters the pug-mill. If a container scale is used, weigh liquid WMA additives before combining with asphalt binder. Keep the container scale separate from other ingredient proportioning. The container scale capacity must be no more than twice the volume of the maximum liquid WMA additives batch size. The container scale’s graduations must be smaller than the proportioning tolerance or 0.001 times the container scale capacity.

WMA additive in Continuous Mixing Plants:

Proportion liquid WMA additives by mass, and add it to the asphalt binder in the production stream between the asphalt binder proportioning and the asphalt binder addition to the aggregate. The plant must comply with “Continuous Mixing HMA Plants” in Chapter 2, II-H. The plant controller must produce a log of production data. The log consists of actual weights for each ingredient in the batch at five-minute intervals during production. Collected batch data must be stored by the plant controller for the duration of the contract, and made available to the Engineer upon request.

Appendix

Calibration and Production Error Limits

Table A - Meter Testing Extremes

Liquid WMA Additive Testing Extremes					
Meter	Size	Minimum	Witness Scale Maximums		Maximum Individual Error
Size	Designation	Test Draft			Warm Mix Add Mixtures, Water
			Capacity	Gradation	
≤ 0.50"	Very Small	50 lb.	100 lb.	0.1 lb.	± 0.5%
0.51" - 0.99"	Small	200 lb.	500 lb.	0.5 lb.	± 0.5%
1.00" - 1.49"	Medium	2,500 lb.	5,000 lb.	1.0 lb.	± 0.5%

Table B – Conveyor and Dry Mass Flow Testing Extremes

Dry WMA Additive Testing Extremes					
Product WMA Additive	Maximum Error		Witness Scale Max/ Min.		Test Run Minimum
	Average	Individual	Min. Capacity	Max. Graduation	
	0.5%	1.0%	500 lbs.	0.1 lb.	100 lbs. or 5 minutes